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GENERAL NOTES.

GEOGRAPHY AND TRAVEL.

THE STATE OF MICHUACAN.—Michuacan is one of the richest and most fertile of the states of Mexico, rich in woods, in mines, and in capacity of cultivation. Along with part of Guanajuato, it formed the ancient kingdom of Mechoacan. Its extent is 55,693 sq. kilometres, its population about 800,000. The entire state is mountainous, and a considerable portion is occupied by lakes, among the principal of which is that of Patgcucero. The coast line is 163 kilometres long and contains the ports of SanTelmo, Bucerico and Marauta. Among the principal peaks of the state are Tarcitaro (3,860 m.), Patambon (3,750 m.), Quinceo (3,324), Tarimangacho (3,104), Zirate (3,340), and San Andres (3,282).

BOLIVIA.—According to an interesting article in the last issue of the Spanish Geographical Society, the area of Upper Peru, now known as Bolivia, is 2,115,329 kilometres, or rather more than four times that of Spain. Its population, according to a census taken in some departments, and calculations made in others, is only 1,182,270, a figure considerably below previous calculations. The engineer Minchi gives the altitude of La Paz as 3,641 m., that of Lake Titicaca at 3,824 m., and

that of the peak of the Illimani as 6,488 m. This height agrees well with the average given by other surveyors. Sorata is thirty or forty metres higher. Among other elevated peaks are Chachacomani (6,203), Hauina (6,184), Murudata, (5,120) Sunchulli (5,546), and Tres Cruces (5,504). All of these as well as Sorata and Illimani are in the department of La Paz. In that of Oraro are Sajama (6,546), Parinacocha (6,376), Pomerape (6,260), Azanagues (5,136) and Guanani (3,968). In Pobors are the peaks of Charague (5,603), Potosi (5,830), Nuevo Mando (5,949), Lipez (5,982), Taguegua (5,704), Guadalupe (5,754), Esmeraca (5,406), Tazna (5,105), and Ubina (5,203), and in Cochabamba that of Tunare (4,726). The most elevated inhabited places are: Tolapalca (4,290), Potosi (4,166), in its highest part, Catamarca (4,141), and Oruro (3,792). The great tableland between the two ranges of the Andes has an average elevation of 3,800 metres.

The mountainous part of Bolivia may be divided into four regions: (1.) that between the sea and the high plateau, poor in vegetation but rich in minerals and salts; (2.) the plateau itself, also poor in its flora, but rich in mines of every class; (3.) the region of the valleys formed by the lateral chains of the interior of Royal Andes, the chains which unite the two main ranges, and the buttresses of the interior range—this is a most fertile country with exuberant vegetation; and (4.) the eastern plains, a land of virgin woods and wilds.

Among the valleys of the third region may be mentioned those of Beni, Santa Cruz, and Cinti, the last famous for its wines. The *yungas* are deep valleys, whose temperature never descends below 21° and rises to 45 C.

In the E. and N. are the great flats of Beni, Santa Cruz, Chiquisaca, and Tarija. The river Beni and its tributaries inundate these flats in the flood season, leaving large lagoons, and giving rise to insalubrious conditions. More to the E. the Paraguay also inundates the flats of Manzo and Gran Chaco, forming the Tarayas lakes. Between the Paraguay and Pilcomayo are great salt lakes, the most notable of which is Izozo. Some sierras arise in the eastern part, on the confines of Brazil, the most easterly that of San Simon.

The greater part of the rivers of Bolivia are affluents of the Amazons or the La Plata, and are navigable. Only one river, the Loce, reaches the Pacific, all others are lost in the Atacama desert.

About a third of the population is white, the rest for the most part Indian or Mestizo. Among the higher classes of the

whites, French customs prevail, but the Chulos or Mestizos still wear the dresses they wore when they were Spanish subjects.

EUROPE.—GEOLOGICAL WORK IN SPAIN.—The two first volumes of the Commission of the Geological map of Spain treat of the geology and mineralogy of the province of Huelva, and will be followed by two other volumes treating of the petrography of the same province. The same Commission has also published the fourteenth volume of its bulletin, which is almost exclusively occupied by a description of the lower cretaceous formation of, by Sr. L. Mallado, forming part of a Palæontological Synopsis of Spain, which commenced with the ninth issue of the same bulletin. The general geological map of Spain, consisting of thirteen sheets, is also almost complete. The Commission of Mining Statistics has also published a map of the peninsula showing the areas conceded in each province for the exploitation of various minerals. The Hydrographical Commission has not only published the plans of various parts of the Mediterranean coast, but is at work upon those of the Philippines.

ENGINEERING WORKS IN EUROPE.—Among engineering works of geographical importance now being carried on in Europe, are the canal across Schleswig from the North Sea to the Baltic, commenced in June, 1887, and likely to be finished next year; and the construction of a railway from Belgrade to Salonica. In Italy a project is on foot to convert Rome into a sea-port by forming a canal from the south-east part of the city to the coast. As the Tiber, at the highest point of the canal, is but twelve metres above the level of the sea, the project does not involve any very great difficulty.

A new port for the city of Bilbao is also projected. Belgium is commencing a series of fortifications upon the river Meuse to protect the territory in case of a new Franco-German war.

SARDINIA.—From the fourteenth to the sixteenth century, during the time that Sardinia belonged to Aragon, the official language of the island was that of Catalonia, but this was superseded by the Castilian tongue after the union of Aragon and Castile. Nevertheless the Catalan language is still spoken at the northern end of the island, where, at the foot of Nurra, the Catalan Sr. Toda, found himself perfectly

understood. In Alguer, an ancient walled city of 12000 inhabitants, the names of the streets are Catalan as are also the speech of the populace and the songs of the children. Since the Peace of Utrecht in 1720, the Castilian tongue has given way to the Italian, yet even within its capital, Cagliari, the Spanish tongue is still used in the nunnery of Santa Clara.

THE MOUNTAIN RANGES OF SPAIN.—The highest peaks of the Pyrenees, according to the recently issued, "*Reseña Geographica y Estadistica de España*," are Nethon, 3404 metres; Pico de Posets, or Landana, 3,367 m.; Maladetta or Montes Malditos, 3,354 m.; and Tres Sorores or Mont Perdu, 3,351 m.

The northern range of the Iberian peninsula is by D. J. Bisco considered as composed of two sections, the one east, the other west, of the northern end of the Iberian range, which is that which forms the western border of the Ebro valley, and which prolongs itself southward sufficiently to form a base from which rise the ranges running east and west between the various rivers of Castille and Andalucia. The highest peaks of the Vasco-Cantabrian or eastern portion of the northern cordillera are: Peña de Cerreda, 2678 m.; Peña Vieja, 2639 m.; Peña Prieta, 2520 m.; and Contes 2373. The two highest peaks of the western or Galicio-Asturian part of the northern range are: Espiguete 2453 m.; and Peña-Ubina, 2300. The Iberian, or north and south system, the highest portion of which is known as the Mountains of Burgos, has no peaks comparable to those of the Pyrenees, its three highest summits being Moncayo 2315 m.; San Lorenzo, 2303 m.; and the Picos de Ebibron, which rise to 2246 metres. The city of Burgos stands at a height of 856 metres.

The ranges which run westward from the Iberian are the Central, between the basins of the Duero and Tajo (Tagus); the Toledo Mountains, between the Tajo and the Guardiana, the Sierra Morena, and the Sierra Nevada. The highest summits of the Central system are: Plaza del Moro Almansor 2,650 metres; Calvitero 2,401 m.; Peñalara 2,400 m.; and Hierro 2,383. The city of Avila stands at a height of 1,126 metres, Segovia at 1,000, and the Observatory of Madrid is 655 metres above sea level. None of the Toledo Mountains attain great elevations, the loftiest being Corocho de Rocigalgo 1,448 metres and Vicente 1,429 m. Still more insignificant is the elevation of the Sierra Morena, which rising but slightly above the plains of Castile, may be regarded as little more than a huge step from those plains, to the valley of the

Guadalquiver. The highest points are, Estrella 1,299 m., and Rebollera 1,160 m.

South of the Guadalquiver, the Penibetic system culminating in the Sierra Nevada, though less continuous and extensive than the Pyrenees, attains in some points elevations second only to the Alps. The two loftiest peaks, Mulhacen 3,481 m., and Veleta 3,470 m., are both near Granada. Next in height come the Cerro de la Alcazaba 3,314 m., and the Cerro de la Caldera 3,289 metres.

AFRICA.—THE MUNI QUESTION.—According to a paper read by Sr. F. Coello, before the Geographical Society of Madrid, (Jan 9, 1889) the rights of Spain in the Gulf of Guinea date from a treaty made with Portugal in 1777, by which the island of Santa Catalina and the Spanish colony of Sacramento (in Brazil) were ceded to Portugal in exchange for the islands *Fernão do Poo* and *Anno Bon*, together with the right to treat with the natives in all the neighboring coasts, from Cape *Formoso* at the mouth of the Niger, to Cape *Lopo Gonçalves*, or Lopez, S. of the *Gabão*. (The Portuguese orthography is here given). Portugal had the right to dispose of these coasts, not only from having discovered them, but from having occupied the Cameroons, the Gaboon (where some relics of the Portuguese dominion have been found), and some points in the interior. In 1778 this treaty was ratified, and a Spanish expedition took possession of Fernando Po and Anno Bon. In 1827 the English occupied the former island, but afterwards surrendered it, and proposed to purchase it for 1,500,000 francs. This proposal was refused, and in 1843 an expedition took possession of both the above islands and of Corisco. The king of Corisco and of the Vengas tribes, who inhabit the neighboring coasts and the banks of the Muni, also acknowledged the sovereignty of Spain. No nation but France has disputed the rights of Spain upon the Muni, nor did France dispute them until many years later. In June, 1843, the French took possession of a blockhouse at the mouth of the Gaboon, the site of the present Libreville, but all annexations since made by France have been to the southward. Various treaties, letters of nationality, etc., have since bound the natives of various parts of this territory to Spain.

The first claim of France dates from May, 1860, and proceeded from the governor of the Gaboon. In 1883 the French openly claimed the territory, not only as far as the river Campo, (the northern boundary of the Spanish possessions)

but even to and beyond the Cameroons. The Germans, who later on commenced to treat with the natives of this part of the coast, recognized in 1885 the rights of Spain as far north as the river Campi. In various expeditions under Dr. Ossario, Ivadier, and the governor Sr. Montes de Oca, the basins of the Campo, Benoto or Eyo, and Muni, were explored, and as many as 370 chiefs recognized the rule of Spain. The territory thus embraced covers about 50,000 sq. kilometres, and if the strip is carried inwards between the same degrees of latitude to the Ubangi, parallel to the French possessions, would contain at least 180,000 k. It is, moreover, a fertile and thoroughly well-watered country, well-wooded and capable of great production.

THE CITY OF WAZAN.—It is extraordinary and almost unexampled, says Don T. de Cuevas, in a recent issue of the *Boletín of the Madrid Geographical Society*, to meet among the most remote folds of the Masamoda mountains a city of at least 11,500 inhabitants, a centre of mercantile activity and of traffic among semi-independent kabyles, the seat of a religious power that at the commencement of this century made the monarchs of the Magreb tremble on their throne, and the residence of Xarifes who descend from kings and even from a higher stock, since in their veins runs the blood of Mohammed. Uazzan has various orthographies, the French know it as Ouezzan, the English as Wazan.

When at the destruction of Baurce, 979-84 A.D. the Edrisite power was overthrown, part of the Edrisites took refuge in the Uad Droa, and established themselves in Axyen, a town of Arjona, at the beginning of the XVI. century, a little after the Xerifes Saadies had acquired the throne of Morocco. From Axyen, the emir Muley Abdallah changed his residence to Wazan. The consent of this Xerif is necessary in order to make the election of the Sultan legal.

GEOGRAPHICAL NOTES.—The Hungarian, M. Dechy has ascended Elbourz and has reconnoitred the glaciers which surround that peak; and M. Trillo has explored the right bank of the Volga and has discovered the ruins of an ancient city, in which, from the marbles, aqueducts, and Arab, Persian, and Tartar coins met with, a high civilization must have existed.

Two small sections of railway have at last been opened in Persia, one from Teheran to Xahzade-Abdulazin, the other from the coast of the Caspian to Amal, the capital of the

province of Mazanderan. A line uniting the Persian gulf and the Caspian sea is also spoken of.

The Germans accuse the English of delaying the rectification of the boundaries between the possessions of the two countries in the Niger region, until they had made sure of their claims over the Upper and Central Binue by means of treaties with the native chiefs. France and England dispute the protectorate of the Egba territory, situated to the north of Porto Novo and Lagos. The English claim that the natural route to Abeokuta, the Egba capital, is by the river Ogun, which disembogues at Lagos, while the French claim that it can be reached as readily by the French river Addopero. The truth is that the Frenchman M. Viard has got ahead of the English in treating with the Egba king.

The expenses of the Congo Free State during 1887, have amounted to 1,891,190 francs, spent in political and judicial administration, transport and mails, constructions, geographical explorations, etc. The receipts are not given, but they must be small, since at present ivory is the only article of commerce.

The treaty by which the Sultan of Zanzibar conceded the greater part of the coast of Zanguebar to Germany, came into force the 15th of August last, but the rebellion of the natives of Pangani has spread along the coast and makes German domination difficult. It is said that at the present time the Germans have abandoned the only two points they had occupied viz : Bagamoyo and Dar-es Salam.

Turkey has sought to reclaim the port of Zeila, in the gulf of Aden, asserting that it was yielded to Egypt on condition of an increased tribute; but England asserts that the said port is in the Egyptian dominion. In the meantime Zeila remains in the hands of England.

Among the boundary disputes which are common in America, there has now risen one which is also a question of money. Rich gold fields have apparently been discovered in Dutch Guiana, between the rivers Lava and Papanaom; but the French call to mind that both these rivers are affluents of the Marouine, which forms the boundary between the two colonies, and therefore doubt the right of the Dutch to the territory.

According to a provisional treaty concluded between Bolivia and the Argentine Republic, the boundary between the two countries follows the parallel of 22° S. from the Paraguay to the Pilcomayo, thus leaving the two coasts of the navigable part of the latter river in the possession of the last named country.

Last March the French took possession of the Society islands, it is said, at the invitation of the inhabitants, but some of the natives of the island Raiatea attacked a French detachment. England has taken possession of the Fanning islands, south of the Sandwich group. England has also acquired the island of Rarotonga, which is advantageously placed between Panama and Australia, and which France considered as a natural connection between Tahiti and New Caledonia.

Germany has declared the neighboring Tonga group, which England intended to take possession of, to be neutral in accordance with the agreement signed by both powers April 6, 1886.

GEOLOGY AND PALÆONTOLOGY.

CREDNER ON PALÆOHATTERIA. The seventh part of Dr. H. Credner's account of the Stegocephali and Saurians found in the "Plauens'ch Grounds," near Dresden, is devoted to the above-named interesting genus of Reptilia. A single species is embraced in the genus, *P. longicaudata* Credner. This animal was of about the size of the *Sphenodon punctatum* of New Zealand, and presents so many points of affinity, that Dr. Credner places it in the same order, the Rhynchocephalia, and even in the same family, the Sphenodontidæ.

An examination of Professor Credner's description and the figures with which it is abundantly illustrated, shows that its describer has not overrated the importance to biology of its discovery. But its nearest ally is not, as Professor Credner supposes, the *Sphenodon punctatum* of New Zealand, but the fossil *Stereosternum tumidum* from the probable carboniferous formation of Brazil. It differs widely from *Sphenodon* in the character of the pelvis, agreeing in this with *Stereosternum*, and with the Pelycosauria. It differs from the Pelycosauria in its two postorbital cranial arches, and in its single-headed ribs, agreeing in the latter point with both *Stereosternum* and *Sphenodon*; and probably in the former point also, but the character of the cranial arches in *Stereosternum* remains unknown. It agrees also with the Brazilian genus in the characters of the tarsus, and differs more from the Pelycosauria and less from the *Sphenodon*. The humerus is also like that of *Stereosternum*.